RIVER STAGES AND FLOODS FOR DECEMBER 1945

By C. R. JORDAN

Precipitation during December was above normal along the Atlantic and Gulf coasts; in western Nebraska, Iowa, and portions of adjoining States; and in the Northwest. Except for the area centered over Iowa, precipitation over the interior of the country was generally below normal. It was particularly dry in a broad area extending from northern Texas to southern Missouri.

No flooding of consequence was reported until near the end of the month, when light overflows occurred in the Southeastern States and in Indiana, and moderate to severe floods developed along the Pacific coast from northern California to Washington.

Atlantic Slope and Eastern Gulf of Mexico Drainage.—Moderately heavy rains during the last week of the month caused substantial rises in the streams of the Southeastern States. Many of the streams exceeded flood stage slightly at numerous points. Seriously high stages or general overflow did not occur and no great damage resulted.

Ohio Basin.—The Scioto River at Larue, Ohio, rose from a stage of 8.4 feet on December 30 to a peak of 12 feet on the 31st, due to the formation of an ice gorge below Larue. No damage was caused by the overflow.

Snow cover in Indiana ranged from 5 to 10 inches on December 24, at which time a general rain of from 1 to 2 inches fell over the State. The severe temperatures that had prevailed for two weeks gave way to moderate temperatures, and a general melting of the snow and ice occurred during the last week of the month. The Wabash River and tributaries rose to above flood stage at several places. Ice in the rivers was loosened and several ice jams were reported, the most pronounced being at Covington, Ind. This jam held large quantities of water back for a week or more, delaying the rise at Terre Haute and below. Little or no damage resulted.

Pacific Slope Drainage.—During the last decade in December rainstorms accompanying a sequence of almost daily frontal passages over northern California resulted in major stream rises, but no serious flooding occurred.

Tributary creeks in the Sacramento Basin caused local overflow of lowlands. The water level in the Sacramento River channel rose steadily, with the danger stage being reached on some of the lower valley levees. This was especially true in the Knights Landing sector where the established danger stage was exceeded by nearly 1 foot.

Several sequences of progressively higher crests passed down the Sacramento River, the final one culminating on December 30 in the Knights Landing-Fremont Wier section. The overflow into Yolo Bypass at Fremont Wier reached a maximum depth of about 3.4 feet on the 30th. In the bypass substandard-leveed island tracts of Little Holland, Prospect Island, and Liberty Island were flooded on the 26th, 27th, and 30th, respectively. Of these tracts, only Liberty Island was planted to winter crops, and here considerable loss was sustained.

The Russian River overflowed its banks at several places; a few summer homes and cottages located along the lower banks of the river were flooded.

A heavy rainfall occurred on the slopes of Mount Tamalpias and caused extreme flooding of small creeks running down the slopes through the vicinity of Mill Valley to Larkspur, with the water running to sufficient heights to flood many homes. No estimate of the damage caused has been received.

Frequent moderate to heavy rains, from December 20–26, over the Eel River Basin caused a sharp rise in the Eel River, beginning on the night of the 26th and cresting early on the 28th. Considerable damage was done to bridges and highways, and debris and silt were deposited in the fields that were flooded. Some choice land near the mouth of the river was washed away.

An exceptionally destructive flood, probably exceeding the January 1943 flood in extent of inundated area and resultant damages, occurred in the Willamette River Basin. The following report of the flood was received from the Weather Bureau Regional Office, Seattle, Wash.:

A combination of widespread rainfall and snow-melt was responsible for the flood. The storm began on the 27th and lasted for 3 days, with intense rain falling during the 24-hour period ending 6 p. m. of December 28. However, total storm rainfall amounts were not excessive. (See Table 1 for comparative 3-day rainfall amounts for the December 1945 and January 1943 storms.) Heavy precipitation during the preceding months saturated the soil at low elevations and produced heavy snow cover in the mountains. The snow-line elevation previous to the flood was approximately 2,000 feet over the watershed.

The high temperature and winds that accompanied the rainstorm produced rapid rates of melting during a short period of time. The melting zone probably extended from 2,000 feet to an estimated maximum freezing level of 9,000 feet. Therefore, a relatively large portion of the watershed contributed run-off during this flood.

Flows in the tributaries were characterized by sharp peaks, low flood volumes, and rapid stream velocities. The important flow contributions came from the upper Willamette, McKenzie, and Santiam Rivers. The estimated discharge for Eugene indicates that the maximum flood of record occurred at that point. (See Table 2.) Although the flood crest traveled rapidly down the Willamette, it did not synchronize with exceptionally high flow from downstream tributaries. Hence the flood peaks at Albany and Salem were not of major proportions.

Nine lives were lost directly or indirectly as a result of the heavy rains and floods. Property damage amounted to several millions of dollars; the final results of a comprehensive survey are not yet available. Most extensive damage was produced in the area above Eugene. In the Glenwood district between Eugene and Springfield, 90 percent of the homes and buildings were damaged by the rapid overflow. Considerable damage was caused to bridges and roads throughout the Willamette Valley from the headwaters down to Oregon City, and may exceed similar damage produced by the 1943 flood. The Engineers estimate that agricultural damage will amount to 50 percent of the total damages produced by the flood. The high velocities of flow carried away a great deal of top soil, destroyed considerable acreage of winter crops, and damaged orchards, hop yards, and fall-planted crops.

Light overflow was reported in the streams of northwest Washington during the last few days of the month. Only minor damage resulted.

TABLE 1.—*Comparative rainfall data*

River	Station	Elev. feet, m. s. l.	Rainfall, 3-day amounts	
			Dec. 30, 1942–Jan. 1943	Dec. 27–29, 1945
Coast Fork	Blackbutte	1,200	7.10	5.22
	Cottage Grove	650	5.96	4.32
Middle Fork	Eula	840	6.35	6.34
	Oakridge	1,313	5.05	4.63
McKenzie	Leaburg	675	6.33	5.14
Calapooya	Holley	350	4.89	4.15
South Santiam	Waterloo	400	4.39	2.65
North Santiam	Mehama	628	4.79	3.83
	Detroit	1,450	6.28	6.56
Pudding	Silver Creek	1,340	4.77	3.60
Molalla	Molalla	320	2.11	2.15
	Sundown Ranch	2,400	4.15	4.76
Clackamas	Cazadero	503	2.88	4.15
Long Tom	Monroe	444	4.99	3.03
	Noti	450	6.27	4.97
Marys	Summit	720	5.61	4.02
	Corvallis Water Bureau.	450	5.61	3.68
Yamhill	Willamina	300	3.76	2.49
Tualatin	Forest Grove	220	1.57	2.24
	Hillsboro	203	1.23	2.35

TABLE 2.—*Comparative flood stages and discharges*

Date	Eugene		Albany		Salem	
	Stage Ft.	Flow c. f. s.	Stage Ft.	Flow c. f. s.	Stage Ft.	Flow c. f. s.
Dec. 1945	18.4	*117,000	30.0	*206,000	28.4	*255,000
Jan. 1943	16.7	100,000	30.6	218,000	30.6	291,000
Jan. 1923	18.0	72,500	30.0	191,000	31.0	358,000
Nov. 1909	21.5	96,000	29.3	182,000	29.4	327,000
Feb. 1890	23.0	113,000	33.8	243,000	37.1	470,000
Jan. 1881	22.2	108,000	32.8	229,000	36.3	428,000
Dec. 1861	23.0	113,000	36.0	274,000	39.0	500,000

*Provisional discharges, U. S. Geological Survey.

FLOOD STAGE REPORT FOR DECEMBER 1945

[All dates in December unless otherwise specified]

River and station	Flood stage	Above flood stages—dates		Crest [1]	
		From—	To—	Stage	Date
ST. LAWRENCE DRAINAGE					
Lake Erie					
St. Marys: Decatur, Ind.	Feet 13	30		Feet	
ATLANTIC SLOPE DRAINAGE					
Roanoke:					
Weldon, N. C.	31	7	8	33.0	7
		28	[2]		
Williamson, N. C.	10	9	17	10.9	13
		30			
Neuse: Goldsboro, N. C.	14	11	13	14.8	12
		31	[2]		
Cape Fear:					
Fayettesville, N. C.	35	31	31	35.9	31
Lock No. 2, Elizabethtown, N. C.	20	7	9	25.5	8
		27	[2]		
PeeDee:		27	28	32.2	27
Cheraw, S. C.	30			34.0	30
		29	[2]	32.2	Jan. 1
Mars Bluff Bridge, S. C.	17	28	[2]	22.0	Jan. 5
Saluda: Pelzer, S. C.	6	5	7	6.5	6
		25	[2]	7.3	27
				6.9	29
		6	6	15.6	6
Broad: Blairs, S. C.	14	26	27	19.2	26
		29	[2]	17.8	30
Wateree: Camden, S. C.	23	30	31	23.4	30
Savannah: Butler Creek, Ga.	21	26	28	23.4	27
Ocmulgee: Abbeville, Ga.	11	31	[2]		
Oconee: Milledgeville, Ga.	20	25	28	25.1	26
EAST GULF OF MEXICO DRAINAGE					
Flint: Albany, Ga.	20	31	[2]		
Apalachicola: Blountstown, Fla.	15	26	[2]		
Choctawhatchee: Caryville, Fla.	12	29	29	12.2	29
Pearl: Pearl River, La.	12	28	Jan. 1	13.6	30-31

FLOOD STAGE REPORT FOR DECEMBER 1945—Con.

River and station	Flood stage	Above flood stages—dates		Crest [1]	
		From—	To—	Stage	Date
MISSISSIPPI SYSTEM					
Ohio Basin					
Scioto: Larue, Ohio	Feet 11	31	31	Feet 12.0	31
West Fork:					
Anderson, Ind.	10	31	[2]		
Elliston, Ind.	18			17.5	27
Edwardsport, Ind.	12	26	[2]	16.5	28
East Fork:					
Seymour, Ind.	14			13.4	26
Shoals, Ind.	25			13.2	31
White:					
Petersburg, Ind.	16	28	[2]	17.3	Jan. 3
Hazleton, Ind.	16	28	[2]	17.7	Jan. 5
Wabash:					
Wabash, Ind.	12	31	Jan. 1	14.2	31
LaFayette, Ind.	11	30	Jan. 3	16.5	Jan. 1
Covington, Ind.	16	31	[2]	23.8	Jan. 2
Terre Haute, Ind.	14	31	[2]		
PACIFIC SLOPE DRAINAGE					
Sacramento Basin					
Sacramento: Knights Landing, Calif.	38	29	31	38.7	30
Eel Basin					
Eel: Fernbridge, Calif.	17.5	27	29	22.6	27
Columbia Basin					
Coast Fork: Saginaw, Oreg.	9	7	7	9.2	7
		28	29	12.4	28
Middle Fork: Eula, Oreg.	13	28	29	18.8	28
McKenzie:					
Leaburg, Oreg.	12	27	31	25.5	28
Hendricks Bridge, Oreg.	13	28	29	13.2	29
Armitage Bridge, Oreg.	11	28	30	17.4	29
Long Tom: Monroe, Oreg.	12	29	29	14.5	29
Calapooya: Holley, Oreg.	10.5	28	28	14.0	28
North Santiam: Mehama, Oreg.	15	28	28	15.4	28
South Santiam: Waterloo, Oreg.	20	28	29	22.8	29
Santiam: Jefferson, Oreg.	13	28	31	22.6	29
South Yamhill:					
Willamina, Oreg.	8	29	29	9.0	29
Whiteson, Oreg.	38	29	31	39.8	30
Molalla: Canby, Oreg.	11	28	29	12.2	28-29
Tualatin: Dilley, Oreg.	12	29	30	12.2	29
Willamette:					
Eugene, Oreg.	12	28	30	18.5	29
Harrisburg, Oreg.	12	7	8	12.6	7
		28	Jan. 1	19.7	29
Corvallis, Oreg.	24	30	31	28.2	30
Albany, Oreg.	20	29	Jan. 1	30.0	30
Salem, Oreg.	20	29	Jan. 1	28.4	30
Oregon City, Oreg.	12	Nov. 30	1	12.3	Nov. 30
		30	Jan. 3	16.5	Dec. 31-Jan. 1

[1] Provisional.
[2] Continued into January.